CALIFORNIA STATE UNIVERSITY, NORTH RIDGE

DIABETIC PATIENT EDUCATION

Evaluation in a Community Hospital

A graduate project submitted in partial satisfaction of the requirements for the degree of Master of Public Health in Community Health Education

by

Robert Andrew Schapper

June, 1974
The graduate project of Robert Andrew Schapper is approved:

Committee Chairman

California State University, Northridge

June, 1974
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index of Tables</td>
<td>iv</td>
</tr>
<tr>
<td>Abstract</td>
<td>vi</td>
</tr>
<tr>
<td>I. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>II. Problem Identification</td>
<td>5</td>
</tr>
<tr>
<td>III. Literature Review</td>
<td>9</td>
</tr>
<tr>
<td>IV. Program Objectives</td>
<td>15</td>
</tr>
<tr>
<td>V. Research Methods</td>
<td>18</td>
</tr>
<tr>
<td>VI. Study Results</td>
<td>33</td>
</tr>
<tr>
<td>VII. Interpretation of Results</td>
<td>53</td>
</tr>
<tr>
<td>VIII. Summary and Conclusion</td>
<td>57</td>
</tr>
<tr>
<td>Bibliography</td>
<td>61</td>
</tr>
<tr>
<td>Appendices</td>
<td>62</td>
</tr>
<tr>
<td>A. Pre-Post Evaluation</td>
<td>62</td>
</tr>
<tr>
<td>B. Demographic Data Collection Instrument</td>
<td>68</td>
</tr>
<tr>
<td>C. Letter Distributed With Extended Post Evaluations</td>
<td>70</td>
</tr>
<tr>
<td>D. Nursing Evaluation Instructions</td>
<td>71</td>
</tr>
<tr>
<td>E. Clinical Data Collection Instrument</td>
<td>73</td>
</tr>
</tbody>
</table>
INDEX OF TABLES
(by Title)

1.0 Operational Objectives ........................................... 17
2.0 Out-Patient Education Program--Content Outline ............ 19
3.0 Description of Study Categories ................................ 19
4.0 Out-Patient Study Populations .................................. 20
5.0 Content Areas--Pre-Post Evaluation ................................ 23
6.0 Diagram of Proposed In-Patient Research Design .......... 29
7.0 Sex Distribution Within Out-Patient Study Populations .... 34
7.1 Age Distributions by Sex Within Out-Patient Study Populations ......................................................... 35
7.2 Comparison of Age and Sex Distribution of Out-Patient Experimental Populations and Non-Study Diabetic Population ............. 35
7.3 Length and Type of Education Within Out-Patient Study Populations ................................................................. 36
8.0 Mean Number of Correct Items for Out-Patient Experimental Group Pre Tests ........................................ 37
8.1 Mean Number of Correct Items for Out-Patient Experimental Group Post Tests .................................................. 38
9.0 Comparison of Mean Number of Correct Items on Out-Patient Experimental Group Pre and Post Tests ........................................ 39
10.0 Mean Number of Correct Items for Out-Patient Experimental and Control Post Tests ........................................ 39
11.0 Mean Number of Correct Items for Out-Patient Experimental and Non-Diabetic Group Post Tests ........................................ 40
ABSTRACT

DIABETIC PATIENT EDUCATION
Evaluation in a Community Hospital

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To master knowledge and techniques of self-management in the light of chronic illness is an achievable reality for many persons living with diabetes. This metabolic disorder characterized by the abnormal secretion of the hormone insulin, is normally a controllable phenomena. Many variables tend to affect this disease process, but recent research in the area of behavior modification has found a correlation between the knowledge level of the individual and the degree of disease stability (Stone, 1961).

Physicians who work with diabetic patients helped to influence the development of an education program for diabetics at Northridge Hospital in the San Fernando Valley. The creation of this program originally designed on an out-patient theme, delivered a much needed service to busy physicians and concerned patients of the local community. The process of patient referral by physician to an approved (by the Diabetic Association of Southern California) out-patient program
opened a new approach to health education for the diabetic, and proved
to be a much needed community service.

The actual instructional program, molded after the design of many
physicians and interested community groups, entered into a process of
a three month evaluation. This program evaluation, inclusive of both
out-patient and in-hospital components, was geared at more closely
defining program effectiveness and involved the author and other coop-
erative hospital staff members. Specific diabetic and non-diabetic
populations were studied and observations were made regarding instruc-
tional effectiveness and patient-physician need gratification. It was
concluded from the study that diabetic populations who received
instruction on an out-patient basis significantly raised their know-
ledge level; in-patients showed very little change in knowledge and
had a very low referral rate to out-patient sessions. Results would
seem to indicate that in-hospital education lacks continuity in
instruction and referral, and many patients do not receive the infor-
mation necessary to maintain disease stability. Based on preliminary
findings and continued study, program expansion was extended to in-
hospital patients.
CHAPTER I
INTRODUCTION

Patient education is an important aspect of health care, especially for those patients who must master knowledge and techniques of self-management essential for living with long term and chronic illnesses. This type of health instruction has become an integral part of a comprehensive approach to patient care in many local community hospitals.

The patient education described in this paper was conducted in a hospital with a specific program for health instruction. The body of this narrative discusses evaluation and modification of an existing diabetes education program, and the process of development of a modified unit for in-patient instruction.

Background

The dissemination of information pertaining to the maintenance and control of diabetes has traditionally been limited to physician-patient interaction and/or interested community based agencies such as the Diabetes Association of Southern California.

Internists who specialize in the area of diabetes, diabeticians, have reflected a concern for the existing system of education available to the diabetic and the community as it relates to obtaining knowledge of the factors involved in maintenance and control of this
It is the prevailing feeling of this group of physicians that diabetes is generally a "controllable" disorder. However, as a controllable disorder, the patient must be educated or made aware of the factors involved in control and maintenance of diabetes. In this sense, "the patient must assume primary responsibility for his own care."*

Increasing numbers of diagnosed diabetics and "potential diabetics" (persons who may exhibit some symptoms of diabetes, but who have not yet been diagnosed) in the San Fernando Valley have imposed a time limitation upon the physician in terms of direct patient-physician interaction. This reduction in availability of the physician has conversely affected the quality and effectiveness of patient education in the physician's office. This is a primary concern to the diabetician, for it is important that the patient understand his condition and be aware of the basic characteristics of the disorder. Lack of patient comprehension of the disease process places a barrier of communication between the physician and the patient. The physician cannot effectively discuss the problem with the patient, the patient cannot understand what the physician is attempting to explain, and typically the patient is unable to assume responsibility for control of his condition. This is a real problem, the solution is education.

There will be some to whom the idea of self-management is foreign, and some who may advocate physician care as the primary force in maintaining the health status of the patient. On the other hand, there may be those who are aware that "due to the nature of the disease,

*Robert Rood, M.D., Diabetes Workshop
control and maintenance does not guarantee the diabetic a long life free of medical complication." The rationale behind self-management is simple and sound on both health and economic aspects. With proper control, the diabetic can live a more active and "normal" life. A diabetic frequently out of control may find greater economic burden placed upon himself, his family and possibly the community due to a probable increase in ambulant care visits, and possibly regular or greater frequency of hospitalization. Considering these circumstances, education seems to be a healthier and less expensive alternative.

The Education Committee of the Diabetes Association of Southern California, hereafter referred to as DASC, became interested in an education program for the San Fernando Valley. They organized interested physicians and consumers in regard to reviewing the need for more appropriate diabetes instruction within the community. The efforts of this group were transposed into what has been called a "protocol" for an instructional program in diabetes education. This protocol, or content outline, was adopted by the education committee as their formal instructional package.

A number of representatives to the Diabetes Education Committee were also on the staff at Northridge Hospital in Northridge. Their perseverance with the hospital's Medical Education Committee and Board of Trustees proved to be significant when their proposal to create an out-patient education program at Northridge was ratified. It was agreed by the hospital's Medical Education Committee that the instructional package created by DASC would serve as the framework.

for the Northridge program. A hospital sub-committee, the Diabetic Steering Committee, under the authority of the Northridge Medical Education Committee was organized and delegated responsibility for program review. The Education Committee of DASC followed by giving Northridge sole endorsement for the San Fernando Valley, and committed DASC resources for duplication of educational materials.

The author's entry into the Northridge program came in August, 1973, about 18 months after the original program was implemented. At that time, the program was running within the original content design suggested by DASC and no program evaluation, or modification had been made since program inception.
CHAPTER II
PROBLEM IDENTIFICATION

A general expression of the purpose of the diabetic education program at Northridge is to provide an educational service to the diabetic population of the San Fernando Valley. At the time of the author's entrance into the program, a number of interested physicians and members of the hospital's diabetic steering committee demonstrated some concern as to whether the program was currently meeting the needs of the diabetic patient. It was suggested that the hospital employ a study to evaluate the instructional program. The author was invited to participate in the review, and was delegated responsibility for implementing a hospital wide study.

Initial review of the existing diabetes education program enabled the author to identify two separate instructional environments. The two areas of in-hospital and out-patient education are independent components of a total patient education program. Each specific component is theoretically designed to meet the particular educational needs of the patient at both an ambulatory and in-patient level, and both instructional programs adopted a common content outline.

Responsibility for planning, implementation and evaluation of the total program formally rests with the hospital diabetic steering committee, but has been informally delegated to the actual teaching
team. This instructional team consisting of two nurse instructors, a registered dietitian, a medical social worker and the hospital volunteer coordinator was observed to be the key interest group involved in actual program development, implementation, and evaluation.

Specific questions regarding the actual relevance of the education program were recently raised by a small number of interested physicians and the author. The primary area of interest rested with the current state of program evaluation. It was observed by a number of interested parties that there was no on-going system of program evaluation, and due to this, many persons assumed that actual instructional effectiveness was not being assessed. This concern relates to the general acceptance by physicians of the concept that knowledge of diabetes relates to the patient's ability to stabilize his condition (Stone, 1961). If the teaching team is not currently evaluating patient learning at the cognitive level, it is not possible to assume that the program contributes to the patient's knowledge of control of this disorder and therefore, the program may be irrelevant.

Closely related to this question of patient knowledge is the area of instructional methodology. The author observed that a specific structured content outline is followed in the out-patient education sessions, but very little consistency in in-hospital instruction is observed. This may be acceptable if patient preassessment is held prior to individual instruction, but this was not done. Here the question of whether the current in-hospital program actually meets the needs of hospitalized diabetic patients is raised. Due to the lack of a planned program for evaluation of activities relating to the in-hos-
hospital program, it is impossible to assume that the existing in-patient education program sufficiently meets patient needs.

Assessment of the existing diabetes education program became the primary problem to be studied. A secondary area relating to the process of patient referral into the out-patient instructional program was also identified as an area of concern. It was observed from past records that only 10% of the total in-patient diabetic population attended out-patient instructional sessions. A question was raised by the author relating to the status of patient follow-up and the need for in-patients to be referred to an out-patient program upon discharge from the hospital. If one accepts Stone's knowledge-stability correlation (generally accepted by the physicians involved in the program), and if in-hospital instruction is sufficiently successful in raising patient knowledge level, the low rate of attendance of ambulatory patients to the out-patient program is not a concern. But, if low levels of success are exhibited in in-hospital instruction, it is fair to assume that diabetic in-patients need further instruction in order to maintain high levels of disease stability. Following this rationale, it is also probable that since only 10% of these patients attend the out-patient program, the balance of diabetic in-patients may receive little or no further instruction. This question relates directly to the evaluation of the current in-hospital program. Based on available information, it would be inappropriate to assume that in-hospital instruction sufficiently meets patient needs. Without empirical data relating to program effectiveness, it is difficult to say something about the effectiveness of the existing referral system.
and the status of non-referred in-patients.

It was concluded by the author and members of the diabetic teaching team that these questions needed to be answered with greater confidence. A study design was developed and implemented to gather data relating to actual program effectiveness.
CHAPTER III
LITERATURE REVIEW

The author's literature review was conducted in reference to specific areas involving evaluation of the existing diabetic education program. The author was interested in reviewing previous studies relating to evaluation of similar diabetic programs, attitudes regarding hospital based patient education, instructional methods and theories of learning, and studies relating to relevance of patient knowledge and control of diabetes.

Analysis of the structure of the traditional hospital nursing department led the author to conclude that patient education is not a singular responsibility and function (Pohl, 1965). Research by Pohl indicated that even though nurses acknowledge this responsibility, over 60% of 1500 nurses studied did not have adequate knowledge of teaching methods to carry out this function. The relative importance of this is reflected in Stone's findings that knowledge of diabetes and factors related to its control has been related to the degree of stability of the disease in individual patients (Stone, 1961).

These factors, combined with the limited time available for in-hospital teaching and the many interferences associated with hospital routine, theoretically make teaching the in-patient a difficult task, and may seriously impede the patient in controlling his disease due to
his inadequate knowledge base.

The author observed that time was a significant factor, and that knowledge level has been correlated to degree of disease stability. Another study by Stone (1961) discussed clinical symptoms of mismanagement and correlated this to lack of knowledge. Stone found that of 160 diabetic patients studied, 126 were rated "poorly controlled" as evidenced by erratic blood sugar levels, recurrent infection, and frequent occurrence of diabetic coma and insulin reaction. Of those 126 patients, 83 had an insufficient knowledge base to allow them to adequately manage their disease. Most of the 83 patients had received instructions on care while they were hospitalized—method of instruction and instructor were not identified. With repeated instruction 60 of the 83 were able to attain enough information to enable them to exercise considerable control in regulating their disease.

The author also reviewed studies relating to knowledge of instructors. Etzweiler (1967) surveyed diabetic patients to find out who taught them, the teacher's degree of knowledge, and the teaching situation. He concluded that diabetic education was not optimal due to lack of knowledge on the part of the instructor, the emotional state of the learner, and the period allowed for learning to occur.

Continued study was directed toward theories of learning in an attempt to find an acceptable model to follow in reference to an in-patient study. Gagne's theories were concentrated on quite heavily. Gagne (1970) defines learning as "a change in human disposition or capability, which can be retained, and which is not simply ascribable to the process of growth" (p.3). Gagne also proposes a hierarchy of
learning, having different internal and external conditions necessary for their occurrence. If this theory of learning is accepted, it is necessary for the instructor to identify the type of learning to be accomplished and the conditions necessary for its accomplishment.

Much of what the diabetic patient must learn is based on discrimination learning such as differentiating signs and symptoms of insulin shock and diabetic coma, testing urine and interpreting results accurately, and recognizing symptoms and signs of infection. Gagne (1970) postulates that the external conditions for such discrimination learning includes a great deal of repetition and reinforcement if the learning is to be accomplished and retained.

Gagne, as well as other theorists, also concludes that the external conditions which affect any learning include instruction, practice, reinforcement, and interference factors. Skinner (DeCesco, 1968) particularly emphasizes the role of reinforcement and the contingencies of reinforcement in the learning situation. According to Skinner, reinforcement must immediately follow the proper response if "S-R bonds" are to be achieved and learning to occur.

According to Gagne (1966), since instruction has a primary influence on learning, it is necessary to know what is expected of instruction. He proposes a model of instruction which indicates that it is necessary to: (1) identify the terminal behavior expected; (2) identify the elements of the stimulus situation; (3) establish a high level of recallability; and (4) guide the thinking of the learner. Based on this model, instruction must then begin with stated objectives of learning which are framed in behavioral terms so that they
might be recognized when accomplished. Next, it is necessary to identify what is to be learned, the stimulus situation. In achieving a high level of recallability one can postulate that practice (repetition) and reinforcement are implied and important. Lastly, in guiding the thinking of the learner, one must use evaluation and feedback to analyze, direct, and correct thinking. Gagne, as well as other theorists, also stipulates that the entering behavior or performance of the individual must be assessed in order to know where to begin instruction and to assess what has been learned following instruction.

In applying Gagne's model of instruction and conditions of learning to the diabetic patient, especially in the in-hospital environment, greater attention should be given toward providing more adequate external learning conditions. In theory, programmed instruction can be a consistent supplement to conventional teaching, and will allow for more facilitation of external conditions by providing a great deal of repetition and reinforcement, which should result in a higher degree of learning and recall.

According to DeCecco (1967), programmed instruction provides the following: (1) material is broken into small steps; (2) frequent responses are necessary; (3) immediate confirmation or correction is provided; and (4) content is appropriately sequenced. Added to this is the flexibility that such instruction also provides that it can be utilized at any time without the assistance of an instructor.

In selecting the type of programmed instruction to be used, it would seem that a "branching" linear program would be most appropriate since it is "stimulus centered". In this type of program, the correct
response to any stimulus directs the attention of the learner to another frame which both reinforces his response and introduces a new segment. If the response is incorrect, the attention is diverted to a segment which both provides feedback of the error and supplementary instruction. In this way the focus of learning is directed more toward discrimination than strict stimulus-response and the program also accounts more effectively for the individual differences of the learner (Lumsdaine, 1962).

A similar learning theory applies to a second program which Friesen refers to as the Adjunct Programme. This program is suggested for use when populations are small in number, and where the expense of linear programming is too high to warrant the end result. Yet self-instruction may be clearly indicated as a means for resolving instructional problems (Friesen, 1973).

The underlying theory in this type of program is the same as that of the linear program, but in adjunct programming, the trainee must construct a response and from this, the instructor can evaluate precisely what the trainee knows. According to Friesen, "Adjunct Programming is a fast, economical and productive means of achieving instructional goals." This supplementary program is based on discrimination learning, but allows for greater overlearning due to the added benefit of a completion segment which allows for an overt constructed response. Working with a book, pamphlet or other material, a diabetic patient would read the material at least once in documentation, and twice in the adjunct programme. This would be a minimum of three times through the pertinent information. After each phase of the adjunct material,
the patient will have had the opportunity to refer back to the documentation for those segments where he had difficulty. "A master validation examination can then be administered to reveal areas in which patients had significant problems and the programmer can then add to the documentation as required to provide additional instruction, or increase the number of questions on the trouble spots, as he chooses (Friesen, 1973)."

The review of the referenced literature gave the author insight into developing an approach toward studying the existing diabetic education program. From the literature, a framework was built for assessing in-hospital instruction, and a pilot study was initiated to evaluate actual levels of existing instructional effectiveness within both in-hospital and out-patient environments.
CHAPTER IV
PROGRAM OBJECTIVES

A preliminary review of the existing diabetes education program allowed the author and members of the teaching team to identify areas of concern regarding program effectiveness. It was suggested that specific program objectives be developed in an evaluative form, to allow this planning body a framework for program expansion, modification and appraisal. The committee followed this suggestion, but took a very passive approach toward participation in actual goal setting. Team members suggested that the steering committee should assume this administrative role, and that the committee should review the concerns of appropriate interest groups (medical staff, administration, DASC, and the teaching team) in an attempt to centralize ideas and develop objectives around common goals. This review never took place. The author observed a level of marked complacency among a majority of the steering committee. A number of the committee members reflected an interest in pursuing a goal identification session, but active support was virtually non-existent. It was their feeling that even though they were interested in better program definition, the real responsibility for program implementation rested with the teaching team. Based on this attitude, the author decided to organize the teaching team to set program goals and develop an evaluation study.
The development of program objectives took place at an organizational level, and dealt basically with activities involved in achieving the primary goal of program evaluation. Table 1.0 diagrammatically illustrates the primary and secondary objectives stated for the program study. It was suggested by the author that once the primary objective of program evaluation was achieved, greater emphasis should be placed on modifying the existing instructional package and that specific instructional objectives should be developed for each content area to be studied at both the in-hospital and out-patient levels. Once evaluation takes place, instructional objectives can be developed and integrated into the formulation of total program goals.
TABLE 1.0 OPERATIONAL OBJECTIVES

Primary Objective: To evaluate both in-hospital and outpatient instructional components of the existing diabetic education program at Northridge Hospital within a six month period.

Secondary Objectives:

(1) To organize the teaching team to discuss the current status of the diabetes education program.

(2) To identify possible problem areas within the existing instructional program at both in-hospital and outpatient levels.

(3) To develop a study design for evaluation of the existing education program.

(4) To identify criteria for evaluation and develop instruments for assessing existing instructional effectiveness.

(5) To implement a pilot study at both instructional levels.

(6) To collect data relating to possible problem areas within the existing instructional program.

(7) To define areas of program weakness based on collected data.

(8) To develop modifications for identified areas of program weakness.

(9) To implement modifications within selected program areas.

(10) To re-evaluate the total program on a specific time interval or on-going basis.
CHAPTER V

RESEARCH METHODS

Evaluation of the existing diabetes education program called for the development of a design for measuring criteria within the framework of the existing instructional setting. A study design based on evaluation of the two instruction components, in-hospital and out-patient education, was implemented in an attempt to gather information pertaining to total program relevance and specific instructional effectiveness within each component.

Out-Patient Education

The existing out-patient education program at Northridge was organized around the original DASC content outline. Annually, approximately 18 out-patient education sessions are held based on content including that which is illustrated in table 2.0. The actual structure of the program is based on five two hour evening sessions held over a one week interval, and instruction is the primary responsibility of the five-member teaching team.

Patient referral is the primary mode of entrance into the out-patient program. Patients who are in-patients at Northridge are generally referred to the out-patient sessions, but patients do attend from within a 10-mile radius of Northridge Hospital. This geographic boundary was set to open a greater area of the community to participa-
tion, but is limited to residents of the San Fernando Valley.

TABLE 2.0 OUT-PATIENT EDUCATION PROGRAM -- CONTENT OUTLINE

1st Session (2 hours)  
Explanation of Diabetes Who Gets Diabetes  
Insulin and Oral Drugs

2nd Session (2 hours)  
Insulin Reactions  
Diabetic Ketoacidosis  
Urine Testing

3rd Session (2 hours)  
Diet

4th Session (2 hours)  
Social Service

5th Session (2 hours)  
Foot Care  
Infections  
Complications

Out-Patient Study Design

A study design was implemented at the out-patient level with the objective of assessing current program activities and evaluating patient progress toward knowledge increase. This design was based upon the study of five groups categorized as illustrated in table 3.0 for a three month period.

TABLE 3.0 DESCRIPTION OF STUDY CATEGORIES

| Study Category A | Out-Patient Diabetics (attending outpatient program for the first time) |
| Study Category B | Non-Diabetic with Relative (person in nuclear family is a diabetic) |
| Study Category C | Non-Diabetic (no relative) |
| Study Category D | Health Professional (nurse, aide, medical assistant, or orderly) |
| Study Category E | In-Patient Diabetics |
Table 4.0 outlines the total number of populations studied at the out-patient level. Selection of the out-patient diabetic experimental groups, those groups that participated by taking part in the educational sessions, was done as randomly as possible, given the restrictions of time and money. The process of selecting the four experimental groups was based on selection of groups over a 12 month period. Given an average of 18 formal out-patient sessions per year, four groups were randomly selected for study from the total of 18. Data relating to age, sex and education was collected on all 18 groups and later correlated to determine whether the four groups selected were actually a representative sample of the target population. A minimum group size was set at 15 persons.

**TABLE 4.0  OUT-PATIENT STUDY POPULATIONS**

| Experimental Group #1          | Out-patient      |
| Experimental Group #2          | Diabetic Groups--|
| Experimental Group #3          | Took part in out-|
|                               | patient instruc-|
| Experimental Group #4          | tional program   |
| Non-Diabetic Comparison Group #1| Non-Diabetic     |
|                               | with Relative*   |
| Non-Diabetic Comparison Group #2| Non-Diabetic--   |
|                               | No Relative*     |
| Diabetic Control Group         | Diabetic Con-    |
|                               | trol Group       |

* for definition see table 3.0

A diabetic control group was also selected for study. This group consisted of diabetics who upon referral to the out-patient program
did not attend. A total of 25 persons were tested from this group, and were randomly selected over a three month period.

Two non-diabetic comparison groups were also selected for study in an attempt to assess knowledge about diabetes in non-diabetic populations. One group consisted of non-diabetics who have diabetic relatives within their nuclear family, and a second population consisted of non-diabetics with no diabetic relatives. The non-diabetic population with diabetic relatives was randomly selected from information obtained from the diabetic program coordinator, and all non-diabetics without diabetic relatives were selected from contacts made by the author. A total of 48 non-diabetics were studied.

Data Collection

Collection of study data consisted primarily of demographic information including age, sex, and formal education of group participants, and pre and post examination scores derived from a paper and pencil test given to the same participants.

In an attempt to assess patient knowledge about diabetes, a 40 item paper and pencil test was designed for use by the author. (Appendix A) This instrument was designed to evaluate patient knowledge prior to entrance into the instructional program, and upon completion of the five day instructional session. The evaluation was designed around the existing content outline typically followed in the instructional program (Table 2.0).

All of the experimental study populations were administered the evaluation on a pre-post basis and two groups were followed for an extended two month period. These groups were administered the eval-
uation at intervals of one and two months preceding completion of the out-patient program.

The diabetic control population was administered the same evaluation once upon discharge from the hospital, and a second time one week later. All non-diabetic groups were pre and post tested over a one week period.

Testing was done in the classroom environment for all experimental groups and was also conducted in the home by the two groups studied for the extended two month period. Testing of the diabetic control group was conducted in the hospital environment prior to discharge, and also was conducted in the home for post test results. Assessment of both non-diabetic groups was limited to the home environment. All pre and post test items were randomized.

All demographic data was collected by use of a "Diabetic Information Sheet" designed by the author (Appendix B). This instrument was administered to each study participant along with the pre test.

Actual collection of data was facilitated by members of the teaching team for both the experimental and control populations. Non-diabetic populations were tested by the author. The extended experimental study groups and home evaluation of the diabetic control group was conducted by the author by mail (Appendix C).

Data relating to specific areas of patient weakness in reference to instructional content was kept for each experimental population. This data was collected by developing a frequency distribution for all missed items on pre and post evaluations. These items were previously categorized as illustrated in table 5.0.
TABLE 5.0 CONTENT AREAS -- PRE-POST EVALUATION

(1) General Information
(2) Diet
(3) Insulin, Oral Drugs and Testing
(4) Reactions

No data was collected relating to clinical symptomology or patient behavior modification in the out-patient study. All other data collected was limited to numbers of participants in the experimental populations who dropped out of the program, size of specific study groups, and length of time patients have been diagnosed diabetic (not used in study results due to too little data).

In-Patient Education

In-patient diabetes instruction at Northridge is generally a product of nursing interaction with patients. The actual structure of the program is similar in content to that of the out-patient component, but instruction is less formal. Diet instruction is taught as a separate unit by a registered dietician, but the balance of instruction is presented by staff nurses, and is subject to variables such as patient census, floor assignments, nursing staffing patterns, patients' severity of illness, nurse's knowledge about diabetes, nursing knowledge of and ability to perform teaching skills, and priority given to patient education by nursing personnel. Notwithstanding these intervening variables, cost of actual instruction is a primary deterrent to structured in-hospital patient education.

The current in-patient component does not evaluate specific
patient progress toward knowledge increase, for no system of evaluation has ever been implemented. Therefore, to assume that all patients who receive instruction have benefitted from the effort expended in providing the service maybe a faulty assumption.

Two specific studies were implemented in an attempt to assess the relevance of in-hospital instruction. The components of these studies involved assessment of nursing knowledge of diabetes, and the instructional methods used in teaching the patient. The main purpose behind these studies was to identify whether existing in-hospital teaching actually helps the patient raise his knowledge level and maintain greater disease stability, and if more effective and less expensive means of instruction can be employed to meet the same goal.

**In-Patient Study Design -- Assessment of Nursing Knowledge About Diabetes**

Originally two areas of interest were to be studied relating to nursing expertise and diabetes instruction, but due to the wishes of the current nursing administration at Northridge, assessment of nursing knowledge of educational skills was not studied. Permission was granted to sample the current full-time nursing staff and assess their knowledge level in diabetes. The main intention of the author was to evaluate "instructor" expertise in the subject area of diabetes in an attempt to eliminate lack of knowledge as a possible variable that may retard in-patient learning.

A random sample of 85 full time nurses were selected for study from seven hospital units. The units selected for study were those medical-surgical and specialty units normally charged with care of diabetic patients.
The 40 item test originally designed to evaluate patient knowledge was issued to all study participants (Appendix A). The process of distribution and collection of the evaluations was decided by the Director of Nursing. Each head nurse received special instructions on how to administer the test to their subordinates, and enough copies of the evaluation were supplied to each head nurse to cover all selected full time nursing staff working in these units. The only restrictions placed on the staff were that only full time, non-float personnel should be tested; the evaluation should be completed without the help of outside resources; and that each evaluation must be identified by giving the nurses' title (RN, LVN, Aide, Orderly) and their unit (medical-surgical, or specialty unit such as Pediatrics, Rehabilitation, ICU, or CCU). All evaluations were to be completed and returned to the author by the date indicated on the instruction sheet (Appendix D).

Nursing results were to be compared to similar results collected from diabetic and non-diabetic groups. The purpose of such a comparison would be to identify nursing level of expertise in comparison to that of non-medical groups and diabetics.

A frequency distribution of missed items was kept of the nurses tested for the purpose of establishing baseline criteria for future inservice education of nursing personnel on diabetes.

In-Patient Study Design -- Instructional Methods

Literature research in the area of diabetes instruction and theories of learning inspired the author to implement a study whereby existing in-patient instructional methodology can be assessed and
compared to supplementary forms of instruction. According to researchers (Friesen, 1973), the use of programmed instruction as a supplementary resource for short term learning situations is very helpful, especially in areas where continued reinforcement is needed to attain higher degrees of recall.

A pilot study was designed by the author* that included assessment of existing instructional methods by comparing in-patient diabetic populations receiving conventional instruction with those receiving supplemental reinforcement through use of programmed instruction. The study has not been completed in its totality, but is included in this narrative to emphasize current activities.

Pilot Study -- Operationalizing the Problem

In-patient education generally begins with the diagnosis of the disease which very frequently occurs within a hospital situation. The discovery of the disease process hits the patient with a tremendous impact and knowledge about the disease can be both reassuring and helpful in coping with the life changes which must occur if he is to successfully manage the illness. Considering the interference factors presented by the patient's emotional reaction as well as those provided by the teaching-learning environment of the hospital, one can assume that neither the internal conditions of the learner nor the external conditions of learning are optimal for adequate learning to occur.

The teaching team noted that most in-house diabetic instruction

*Original design suggested by Mary Lou Markovich, RN, currently working as a volunteer in the area of mental health at Northridge Hospital.
occurs in the patient's room, using conventional teaching strategies of discussion and reading materials. Instruction is frequently interrupted by hospital routine and this necessitates that the patient read material on his own and review it at a later time with the instructor. Although this method of learning is not questioned by the author, in most situations, the patient frequently misses important material, doesn't get immediate feedback, and certainly not immediate reinforcement, all of which seem to be necessary for learning with a high degree of recall to occur.

In addition to the above factors, the learning which needs to occur involves a great degree of discrimination, and is most often totally new for the patient. Considering all these factors, it is not difficult to see why the patient who has been able to repeat information and seems to have learned it, is unable to recall it, and therefore utilize it after leaving the hospital. In addition to this we must add the realistic time limit imposed on the learner and instructor. It would therefore seem that supplementing a conventional teaching program with programmed instruction would facilitate a greater degree of learning, provide a more adequate knowledge base, and because of the knowledge base, would enable the patient to better manage his illness after discharge.

**Operational Definitions**

Conventional teaching indicates an instructional program which utilizes lecture, discussion, literature, and charts. Content will include basic physiology, diet management, use of insulin and oral drugs, exercise, diabetic coma, insulin reaction, prevention of com-
Management of disease is defined as the patient's ability to follow the treatment regime as evidenced by: (1) keeping clinic appointments for routine checks, (2) relatively stable levels of blood sugar at clinic appointments, (3) use of medication as prescribed, (4) consistency in urine testing, and (5) no occurrence of complications such as insulin reaction, diabetic coma, or infection.

Degree of learning will indicate the amount of learning which has taken place as evidenced by the difference between the patient's pre and post instructional test.

The instructional period will be limited to a 4 day span since this most closely represents the usual length of hospital stay after diagnostic work has been completed. Formal instruction will be given each day during the afternoon. Afternoon is chosen because it does not interfere with doctor visits, visiting hours, and less so with hospital routine and schedules.

Problem Statement and Hypothesis to be Tested

Problem Statement: Does the method of instruction affect learning?

Hypothesis to be Tested: Diabetic patients receiving both conventional and programmed instruction will score higher on post-instructional tests than will those receiving only conventional teaching.

Methodology

The hypothesis will be tested on two groups of patients, each having the same nurse instructor. Since the method of instruction is being tested, it is necessary to keep as many extraneous variables controlled as possible, and using the same instructor will at least
eliminate the individual instructor differences which could affect the study results. Table 6.0 is a diagramatic representation of the research design. The content presented to each group will be consistent so that the only instructional differences will be that of the programmed instruction for the experimental group. Both groups then have equal opportunity to learn, but the experimental group has greater opportunity to increase learning and recall by increased practice, feedback, and reinforcement, the external conditions which have been identified as necessary to learning and particularly important to discrimination learning.

**TABLE 6.0 DIAGRAM OF PROPOSED IN-PATIENT RESEARCH DESIGN**

<table>
<thead>
<tr>
<th>Study Populations</th>
<th>Independent Variable</th>
<th>Dependent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Conventional teaching and programmed instruction</td>
<td>Greater degree of learning (higher post test scores)</td>
</tr>
<tr>
<td>Control</td>
<td>Conventional teaching</td>
<td>Lesser degree of learning (lower post test scores)</td>
</tr>
</tbody>
</table>

**Sample**

The subjects chosen for participation in the study will be selected from hospitalized adult patients with newly diagnosed diabetes mellitus. Any such patient between the ages of 20 and 50 and without any known learning disabilities or language problems will be pre-tested for inclusion in the study. Any patient who scores over 60% on the pre-test will not be considered for the sample to be studied. This arbitrary restriction is placed because higher test scores imply
previous learning which could throw off the study results.

At this time it is not felt by the author that sexual, cultural
cultural difference, or marital status variables will seriously con-
found the study, and these extraneous variables will therefore not be
controlled. Education level also influences ability to learn, so the
assignment of subjects to control or experimental groups will be done
on a random basis in the hope that this, as well as the effects of
other extraneous variables, will be equally distributed between the
two groups. The total sample size will be 50, with 25 subjects in
each group.

Setting

All teaching and testing will be done in a classroom setting.
For the experimental group, the use of the programmed instruction will
take place within the patient's hospital room.

Sequence of Data Collection

All patients will be pre-tested before inclusion in the study.
They will then experience the instructional program, and on completion
of the fourth day of instruction, will be given the same randomized
post-test. A second instrument used in data collection will be com-
pleted one month after discharge from the hospital.

Data Collection Instruments

There will be two data collection instruments utilized in mea-
suring the dependent variables (table 6.0). A paper and pencil test
has been devised to measure both the entering behavior and the degree
of learning attained. This instrument can be found in the appendix
of this paper (Appendix A). The test is composed of 40 multiple
choice questions. Reliability for the test will be established on a test-retest basis during a pre-test of the instrument and prior to its use in the actual study.

The second instrument, also found in the appendix (Appendix E), will be used to measure the patient's ability to manage his illness as evidenced by his attendance at each scheduled appointment, consistency of urine testing as indicated by a self kept record, stability of blood sugar levels recorded at each appointment, frequency of self reported insulin reaction, and frequency of infection. The validity for this instrument is based on content validity in that a survey of the literature reveals that these factors indicate degree of control of the disease. The study by Stone also reveals these factors to be related to the knowledge of the individual about his disease and its management, and therefore, some construct validity could be claimed. Again, the reliability of this instrument will be established by a test-retest procedure to be conducted before use of the instrument in the study. It must be noted that even with the assumed claims of validity and reliability, the instrument has some degree of limitation, since it asks for self reported data in four areas and must therefore rely ultimately on the honesty of the patient.

Proposed Intervention

As outlined previously, the intervention or independent variable to be introduced is the addition of programmed instruction to the present instructional program. This program will be consistent in content and sequencing with the conventional program, and will be of an adjunct type (Friesen, 1973), to hopefully increase discrimination
learning and recall. The programmed instruction should enhance learning because of the type of learning required and because it allows for a good deal of guided repetition and reinforcement. Actual use of the programmed instruction would be encouraged for at least a one hour period daily, and a record of actual time spent in using the program would be kept by the patient as well as by the nursing staff.

Implementation of the pilot study began with testing of the control group. It was decided that due to the lack of an appropriate programmed instructional package at the beginning of program implementation, the author, with the help of the teaching team, should develop an appropriate instructional package based on the Northridge content outline. This package is currently under development and will be implemented as soon as it is refined.
CHAPTER VI
STUDY RESULTS

Two separate studies were undertaken by the teaching team at Northridge Hospital in an attempt to evaluate the current diabetic education program. As outlined in the previous chapters, a study design involving diabetics who attended the out-patient education program was implemented in an attempt to gather data relating to the effectiveness of the program as demonstrated by increase in patient knowledge about diabetes. A second study involved the evaluation of the existing in-patient program and was designed to test differences in educational methods used for in-patient education. Both studies were concerned with defining existing program effectiveness and collecting data whereby appropriate modifications could be made to offer the diabetic patient an educational program that meets his needs.

Out-Patient Study Results

Experimental and control diabetic population samples used in the out-patient study were selected by a random process. Data was collected in reference to sex, age and educational characteristics to determine if these populations could be generally described as representative samples of the diabetic population who use the facilities of Northridge Hospital. Tables 7.0-7.3 represent a brief demographic data analysis of all groups included in the out-patient study.
### TABLE 7.0  SEX DISTRIBUTION WITHIN OUT-PATIENT STUDY POPULATIONS

<table>
<thead>
<tr>
<th>Group</th>
<th>Males</th>
<th>%</th>
<th>Females</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Diabetic Groups (N=69)</td>
<td>36</td>
<td>52.2%</td>
<td>33</td>
<td>47.8%</td>
</tr>
<tr>
<td>Control Diabetic Group (N=25)</td>
<td>12</td>
<td>48.0%</td>
<td>13</td>
<td>52.0%</td>
</tr>
<tr>
<td>Non-Diabetic Groups (N=48)</td>
<td>22</td>
<td>45.8%</td>
<td>26</td>
<td>54.2%</td>
</tr>
<tr>
<td>Total (N=142)</td>
<td>70</td>
<td>49.3%</td>
<td>72</td>
<td>50.7%</td>
</tr>
</tbody>
</table>

\( \chi^2 = 4.75; \) \( df = 2; \) \( P > 0.05 \) Not Significant

Table 7.0 illustrates the distribution of sexes within the diabetic experimental and control groups, and the non-diabetic study population. Results of this review indicates that there was nearly a 50% sex distribution within all study populations. The study distribution is below that which normally is reported for state and national statistics (52%-60% male),* but the size of the sample, location of the study, and a variety of other intervening variables may restrict true randomization of patients. It is also possible that these statistics might not correspond to national figures due to differences in sampling techniques, and localized population characteristics.

Table 7.1 illustrates an age distribution by sex for the same three study populations. Data collected in reference to group age distribution finds similar statistics exhibited by all three groups. In all instances male representatives were older than female representatives, and in the diabetic populations this range was from four to

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*Diabetes Association of Southern California
six years. However, the differences were not statistically significant.

<table>
<thead>
<tr>
<th>TABLE 7.1</th>
<th>AGE DISTRIBUTIONS BY SEX WITHIN OUT-PATIENT STUDY POPULATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>Mean Age Males</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------</td>
</tr>
<tr>
<td>Experimental Diabetic Groups (N=69)</td>
<td>49</td>
</tr>
<tr>
<td>Control Diabetic Group (N=25)</td>
<td>55</td>
</tr>
<tr>
<td>Non-Diabetic Groups (N=48)</td>
<td>43</td>
</tr>
<tr>
<td>Total (N=142)</td>
<td>48</td>
</tr>
</tbody>
</table>

$\chi^2 = 1.31; \ df = 2; \ p > 0.05$ Not Significant

<table>
<thead>
<tr>
<th>TABLE 7.2</th>
<th>COMPARISON OF AGE AND SEX DISTRIBUTION OF OUT-PATIENT EXPERIMENTAL POPULATIONS AND NON-STUDY DIABETIC POPULATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>Mean Age Males</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------</td>
</tr>
<tr>
<td>*Non-Study Diabetic Population (N=170)</td>
<td>48</td>
</tr>
<tr>
<td>**Experimental Diabetic Populations (N=69)</td>
<td>46</td>
</tr>
<tr>
<td>Total (N=239)</td>
<td>47</td>
</tr>
</tbody>
</table>

$\chi^2 = 1.93; \ df = 1; \ p > 0.05$ Not Significant

*Consists of all diabetic groups who attended the out-patient program over a twelve month period, but were not included in the study, (14 groups)

**Consists of the four study populations used who attended the out-patient program within the same twelve month period.
Table 7.2 compares both age and sex characteristics of the experimental diabetic population and the population of diabetics from which the experimental sample was extracted (non-study population).

Review of the data compiled regarding the two populations indicates that both age and sex characteristics for both groups are similar in nature, and both populations exhibit a two to five per cent male majority. These figures closely correlate with national rates.

Table 7.3 illustrates a comparison of length and type of formal education of study participants. All three study groups depict similar formal educational preparation with all study groups experiencing at least a high school education.

Collection of demographic data on all study populations allowed the team to identify specific population characteristics. Statistical testing indicates no significant differences between study and non-study populations, and it was concluded that the diabetic experimental
and control populations were representative samples of the target population based on the data collected. This data is not conclusive due to lack of screening of socio-economic variables such as income, religion, place of residence, race, family size, and medical history, but preliminary study provides a foundation upon which more intensive study of demography can be done.

The results of this study allow the author to assume that study results are not confounded by significant differences in group educational levels, age and sex characteristics.

The outpatient study design primarily consisted of analysis of pre and post examination scores on a randomized knowledge test.

### TABLE 8.0 MEAN NUMBER OF CORRECT ITEMS FOR OUTPATIENT EXPERIMENTAL GROUP PRE TESTS

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>$\bar{X}$</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group #1</td>
<td>20</td>
<td>25.8</td>
<td>64.5%</td>
</tr>
<tr>
<td>Experimental Group #2</td>
<td>20</td>
<td>24.1</td>
<td>60.3%</td>
</tr>
<tr>
<td>Experimental Group #3</td>
<td>14</td>
<td>27.0</td>
<td>67.5%</td>
</tr>
<tr>
<td>Experimental Group #4</td>
<td>15</td>
<td>26.4</td>
<td>66.0%</td>
</tr>
</tbody>
</table>

| Total               | 69 | 25.8      | 64.5% |

$F=78; \text{ df}=3,65; \quad P>.05 \quad \text{Not Significant}$

Tables 8.0 and 8.1 illustrate variance in experimental group test results on both pre and post evaluations. Analysis of data suggests that all four experimental groups scored consistently close to one another in both pre and post evaluations. Statistical testing
suggests that no significant differences exist between test scores.

TABLE 8.1  MEAN NUMBER OF CORRECT ITEMS FOR OUTPATIENT EXPERIMENTAL GROUP POST TESTS

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>$\overline{X}_T$</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group #1</td>
<td>13</td>
<td>36.4</td>
<td>91.0%</td>
</tr>
<tr>
<td>Experimental Group #2</td>
<td>15</td>
<td>36.1</td>
<td>90.3%</td>
</tr>
<tr>
<td>Experimental Group #3</td>
<td>14</td>
<td>34.8</td>
<td>87.0%</td>
</tr>
<tr>
<td>Experimental Group #4</td>
<td>8</td>
<td>35.0</td>
<td>87.5%</td>
</tr>
</tbody>
</table>

Total 50 35.6 88.9%

F = .89; df = 3.46; P > .05 Not Significant

Table 9.0 compares the mean scores of the out-patient experimental group on pre and post evaluations. Results of this study indicate that significant differences were recorded by experimental populations when comparing pre test scores with post test results. This suggests that the instructional program did affect levels of patient knowledge about diabetes.

The diabetic groups that attended the educational sessions were identified as experimental diabetic populations. The diabetic group that did not receive any health instruction beyond that which they might normally pick up through daily contacts with their environment, was identified as a control population. Comparison of the total group mean score of all four experimental populations was made with the diabetic control group to determine if those diabetics who attended the educational sessions scored significantly higher on their post
examinations than the control population.

<table>
<thead>
<tr>
<th>TABLE 9.0</th>
<th>COMPARISON OF MEAN NUMBER OF CORRECT ITEMS ON OUT-PATIENT EXPERIMENTAL GROUP PRE AND POST TESTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testing</td>
<td>$\bar{X}_T$</td>
</tr>
<tr>
<td>Pre Test (N=69)</td>
<td>25.8</td>
</tr>
<tr>
<td>Post Test (N=50)</td>
<td>35.6</td>
</tr>
<tr>
<td>Total</td>
<td>30.7</td>
</tr>
<tr>
<td>$t=10.57; \ df=49; P&gt;.05$</td>
<td>Not Significant</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE 10.0</th>
<th>MEAN NUMBER OF CORRECT ITEMS FOR OUT-PATIENT EXPERIMENTAL AND CONTROL POST TESTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>Post Test $\bar{X}_T$</td>
</tr>
<tr>
<td>Experimental Diabetic (N=50)</td>
<td>35.6</td>
</tr>
<tr>
<td>Control Diabetic (N=25)</td>
<td>26.0</td>
</tr>
<tr>
<td>Total</td>
<td>$t=7.27; \ df=73; P&lt;.05$</td>
</tr>
</tbody>
</table>

Table 10.0 illustrates the results of a comparison of group mean post test scores for experimental and control diabetic populations. Statistical analysis of test scores indicate that significant differences exist between the two groups; which further indicates that persons who participate in the instructional program increased their knowledge level significantly greater than those persons who do not receive instruction.
Data collected relating to non-diabetic testing also strengthens the assumption that the instructional program positively affects patient knowledge, for comparison of non-diabetic post scores with experimental group scores (table 11.0) show significant differences in group knowledge levels as exhibited by higher experimental group post test scores. Based on comparison of study group post evaluations, the author made the assumption that those persons who received diabetes instruction significantly raised their knowledge level above those who received no health instruction. This assumption is also supported by comparing group cumulative pre test scores as illustrated in table 12.0. This comparison of study group pre test scores indicates that study groups did not differ significantly in their knowledge level prior to any planned health instruction. From this data one might suggest that out-patient instruction does affect the patient's level of knowledge.

Further study of two diabetic experimental groups was initiated for the purpose of evaluating group retention of instructional
content. The groups were retested at one month intervals for a two month period.

**TABLE 12.0**  
MEAN NUMBER OF CORRECT ITEMS FOR ALL OUT-PATIENT STUDY GROUP PRE TESTS

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre Test Xr</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Diabetic</td>
<td>25.7</td>
<td>64.3%</td>
</tr>
<tr>
<td>(N=69)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Diabetic</td>
<td>24.6</td>
<td>61.5%</td>
</tr>
<tr>
<td>(N=25)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Diabetic</td>
<td>22.6</td>
<td>56.3%</td>
</tr>
<tr>
<td>(N=48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (N=142)</td>
<td>24.5</td>
<td>61.3%</td>
</tr>
<tr>
<td></td>
<td>P=.254; df=2.139; P &gt; .05 Not Significant</td>
<td></td>
</tr>
</tbody>
</table>

**TABLE 13.0**  
COMPARISON OF MEAN NUMBER OF CORRECT ITEMS ON FOLLOW-UP POST TESTS FOR TWO EXTENDED EXPERIMENTAL DIABETIC POPULATIONS

<table>
<thead>
<tr>
<th>Group</th>
<th>Post Test #1</th>
<th>%</th>
<th>Post Test #2</th>
<th>%</th>
<th>Post Test #3</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group #2 (N=20)</td>
<td>36.1</td>
<td>90.3%</td>
<td>36.3</td>
<td>90.8%</td>
<td>35.3</td>
<td>86.3%</td>
</tr>
<tr>
<td>Experimental</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group #3 (N=14)</td>
<td>34.8</td>
<td>89.0%</td>
<td>35.8</td>
<td>89.5%</td>
<td>34.3</td>
<td>85.0%</td>
</tr>
<tr>
<td>Total (N=34)</td>
<td>35.6</td>
<td>89.0%</td>
<td>36.1</td>
<td>90.3%</td>
<td>34.9</td>
<td>87.3%</td>
</tr>
<tr>
<td></td>
<td>t=1.71; df=17</td>
<td></td>
<td>t=.98; df=8</td>
<td></td>
<td>t=1.32; df=17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P &gt; .05</td>
<td></td>
<td>P &gt; .05</td>
<td></td>
<td>P &gt; .05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not Significant</td>
<td></td>
<td>Not Significant</td>
<td></td>
<td>Not Significant</td>
<td></td>
</tr>
</tbody>
</table>
Table 13.0 illustrates test results for the extended two month period. Statistical analysis of post test scores indicate that both groups retained 98% of the pertinent information imparted during the instructional program as determined by scores obtained from the extended post test, and no significant differences between group results were observed.

Evaluation of missed test responses was an area of concern for the teaching team. It was felt that if an instrument was available to evaluate areas of content strengths and weaknesses, the team would at least have some baseline data to use when evaluating the instructional outline. Tables 14.0 and 14.1 gave reference to areas of instructional content and the corresponding rate of missed responses by per cent on both pre and post test situations for the out-patient experimental study groups.

<table>
<thead>
<tr>
<th>Content Area</th>
<th>Study Group 1 (N=20)</th>
<th>Study Group 2 (N=20)</th>
<th>Study Group 3 (N=14)</th>
<th>Study Group 4 (N=15)</th>
<th>Per Cent Missed (cumulative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Information</td>
<td>9.8%</td>
<td>8.1%</td>
<td>7.7%</td>
<td>7.8%</td>
<td>8.6%</td>
</tr>
<tr>
<td>Diet</td>
<td>31.0%</td>
<td>31.9%</td>
<td>25.1%</td>
<td>25.0%</td>
<td>28.9%</td>
</tr>
<tr>
<td>Insulin, Oral Drugs and Testing</td>
<td>30.2%</td>
<td>30.4%</td>
<td>33.3%</td>
<td>33.4%</td>
<td>31.5%</td>
</tr>
<tr>
<td>Reactions</td>
<td>29.0%</td>
<td>29.6%</td>
<td>33.9%</td>
<td>33.8%</td>
<td>31.0%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
### TABLE 14.1
PERCENT DISTRIBUTION OF POST TEST MISSED RESPONSES BY CONTENT AREA FOR EXPERIMENTAL STUDY GROUPS 1-4

<table>
<thead>
<tr>
<th>Content Area</th>
<th>Study Group 1 (N=12)</th>
<th>Study Group 2 (N=13)</th>
<th>Study Group 3 (N=16)</th>
<th>Study Group 4 (N=8)</th>
<th>Per Cent Missed (cumulative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Information</td>
<td>2.6%</td>
<td>7.7%</td>
<td>4.3%</td>
<td>7.0%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Diet</td>
<td>26.3%</td>
<td>10.3%</td>
<td>7.2%</td>
<td>11.6%</td>
<td>12.7%</td>
</tr>
<tr>
<td>Insulin, Oral Drugs and Testing</td>
<td>42.1%</td>
<td>38.5%</td>
<td>55.2%</td>
<td>44.2%</td>
<td>46.6%</td>
</tr>
<tr>
<td>Reactions</td>
<td>29.0%</td>
<td>43.5%</td>
<td>33.3%</td>
<td>37.2%</td>
<td>35.4%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

General comparison of the differences in group percentages indicate that questions most frequently missed deal with content relating to the administration of insulin, oral drugs and testing. Comparison of post test results with pre test distributions tend to indicate that there is a gradual reduction of missed responses in the area of diet control. This is only a brief comparison study. The author does not feel that the information here is of the validity to make concrete statements about content in the program. But, if one looks at the minimal degree of variance between content areas as illustrated in the data, it is possible that this information may be reliable and can be used as a basis for future study.
TABLE 15.0  RATE OF DIABETIC DROP-OUT FROM OUT-PATIENT EXPERIMENTAL GROUPS

<table>
<thead>
<tr>
<th>Group</th>
<th>Number Pre Tested</th>
<th>Number Post Tested</th>
<th>Rate of Drop-Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group #1</td>
<td>20</td>
<td>13</td>
<td>35.0%</td>
</tr>
<tr>
<td>Experimental Group #2</td>
<td>20</td>
<td>15</td>
<td>25.0%</td>
</tr>
<tr>
<td>Experimental Group #3</td>
<td>14</td>
<td>14</td>
<td>00.0%</td>
</tr>
<tr>
<td>Experimental Group #4</td>
<td>15</td>
<td>8</td>
<td>46.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>69</strong></td>
<td><strong>50</strong></td>
<td><strong>27.5%</strong></td>
</tr>
</tbody>
</table>

\[ X^2 = 1.33; \text{ df}=9; P > .05 \text{ Not Significant} \]

Table 15.0 diagrammatically displays a brief analysis of the rate of drop-out by diabetic patients from the out-patient diabetic program. The author discovered a 27.5% drop-out rate among diabetics in the experimental test groups. It is possible that this rate may reflect a situational problem in the sense that the patient may not be able to cope with the idea of sharing the information that he or she is a diabetic. It is suggested that a closer look be taken at this group of drop-outs to see why they do not continue in the program. It is felt by the author that a variety of variables may be at the root of this problem and to make assumptions at this point without further study would be pointless.

Two other areas of interest in the out-patient study include methods used to collect data and the evaluation of the test instrument. As mentioned in an earlier chapter, two methods of data collection were used in following the study groups. Follow-up on the two out-
patient diabetic experimental groups that were given the rerandomized post test for an extended two month period indicated some difference in test scores, depending upon where the examination was completed. Experimental groups two and three were each mailed copies of the post test with a letter of introduction (Appendix E), and instructions for completing the evaluation. Table 16.0 illustrates the specific groups that were instructed to complete the test by return mail. It can be observed that on the first month evaluation, both groups scored higher in their home environments than when they were tested the second month at the hospital, but this difference was not statistically significant.

### Table 16.0

<table>
<thead>
<tr>
<th>Group</th>
<th>Home (by mail)</th>
<th>%</th>
<th>Hospital</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group #2 (N=20)</td>
<td>36.3</td>
<td>90.8%</td>
<td>35.8</td>
<td>89.5%</td>
</tr>
<tr>
<td>Experimental Group #3 (N=14)</td>
<td>35.3</td>
<td>88.3%</td>
<td>34.3</td>
<td>85.8%</td>
</tr>
<tr>
<td>Total (N=34)</td>
<td>35.9</td>
<td>89.8%</td>
<td>35.2</td>
<td>88.0%</td>
</tr>
</tbody>
</table>

\[X^2 = .002; \quad df=1; \quad P > .05 \quad \text{Not Significant}\]

The author is not sure why this happened, especially since the mean scores of both groups were higher one month following original instruction. The only conclusion that could be made at this time is that the hospital environment might tend to leave the patient more nervous, tense, or unrelaxed than in the home. These variables are difficult to measure and should be studied further. The point of
interest that became a concern for the teaching group was the radical
difference in return rate when the test was to be returned by mail.
Of 29 evaluations sent out, only 11 were returned for a rate of return
of only 37.9%.

Evaluation of the test instrument has not been done as of yet.
But, the author does feel that with the multiple choice test design,
all possible selections of a correct answer should be of reasonable
difficulty. In each of the 40 questions which makes up the evalua-
tion, a choice of "I Don't Know" is left to the student. It is the
opinion of the author that by taking a test question with four possi-
ble correct answers and leaving one as an automatic "incorrect choice"
the test becomes unreliable based on the idea that with decreased
chance to select a wrong answer, more students will guess at a
question rather than to admit to himself that he doesn't know the
answer. This type of guessing helps to confound test results, unless
the test is designed with this in mind.

The author was interested in evaluating the frequency of possible
guesses made per evaluation. A small random sample of 20 pretests was
taken and results indicated that 71% of all missed responses were
questions where the student failed to mark the selection, "I Don't
Know". It is hoped by the author that the teaching team will develop
interest in modifying the current instrument used for knowledge base
evaluation.

In-Patient Study Results

Data collected in the in-patient program has been limited to an
evaluation of nursing expertise on diabetes, and the pilot study
involving comparison of the conventional instructional approach to
in-house education with a supplemental instructional learning program.

The nursing evaluation was implemented prior to planning for the
pilot study on instructional methods. Table 17.0 outlines the two
categories of nurses tested and the mean scores for each group. From
the data it can be observed that the RN's knowledge base is superior
to that of the nurse aide, which was to be expected.

**TABLE 17.0 MEAN NUMBER OF CORRECT ITEMS ON
IN-PATIENT NURSING EVALUATION**

<table>
<thead>
<tr>
<th>Group</th>
<th>$\bar{x}_T$</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>RN Group</td>
<td>34.7</td>
<td>86.8%</td>
</tr>
<tr>
<td>(N=31)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NA Group</td>
<td>27.4</td>
<td>68.5%</td>
</tr>
<tr>
<td>(N=17)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (N=48)</td>
<td>32.1</td>
<td>80.3%</td>
</tr>
</tbody>
</table>

$\text{t} = 6.97; \text{df} = 46; \quad P < .05$

Table 18.0 illustrates the differences in total nursing perfor-
mance on the evaluation. It can be observed that by looking at the
rates of items missed in specific areas of content, the professional
staff missed a greater proportion of questions in regard to diet than
did the nurse aides. This was an interesting observation, for it was
the opinion of the teaching team that this is not an unnatural phen-
onema in hospitals. Traditionally, diet instruction is handled by the
dietician, and therefore nurses do not become as familiar as one would
expect with the area of diet control. The author thought this a
worthwhile discovery, and it was recommended that a supplemental in-
service program be developed for the nursing staff.

<table>
<thead>
<tr>
<th>Total Population Sampled</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Information</td>
</tr>
<tr>
<td>Diet</td>
</tr>
<tr>
<td>Insulin, Oral Drugs, Testing</td>
</tr>
<tr>
<td>Reactions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RN Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Information</td>
</tr>
<tr>
<td>Diet</td>
</tr>
<tr>
<td>Insulin, Oral Drugs, Testing</td>
</tr>
<tr>
<td>Reactions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NA Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Information</td>
</tr>
<tr>
<td>Diet</td>
</tr>
<tr>
<td>Insulin, Oral Drugs, Testing</td>
</tr>
<tr>
<td>Reactions</td>
</tr>
</tbody>
</table>
Data relating to nursing units was also collected in an attempt to identify any weak areas among the nursing staff. A total sample of 83 nurses was taken. From this sample 54 evaluations were returned and graded. (65.1% return rate) Of the evaluations returned, 21 nurses identified their work area as a medical-surgical area and 26 nurses identified themselves as specialty unit nurses; the remaining seven failed to identify themselves as instructed. Table 19.0 gives a brief summary of the differences in mean test scores by the two units. As can be observed, there was no significant difference in test results between tested hospital nursing units.

<table>
<thead>
<tr>
<th>Unit</th>
<th>X̄ (31.1)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical - Surgical (N=21)</td>
<td>31.3</td>
<td>78.3%</td>
</tr>
<tr>
<td>Specialty (Rehabilitation, ICU, CCU, Pediatrics) (N=26)</td>
<td>30.9</td>
<td>77.3%</td>
</tr>
<tr>
<td>Total (N=47)</td>
<td>31.1</td>
<td>77.8%</td>
</tr>
</tbody>
</table>

The implementation of the pilot study comparing the use of programmed instruction to the existing conventional approach of in-patient education just recently began. It is not possible at this time to analyze data derived from this study, for the experimental group has not yet been tested. The implementation of the programmed
instructional unit is projected for early June, and at present has not been completely developed and tested.

Some research into the control diabetic population has been done and much information has been obtained regarding the present status of in-hospital diabetics. Earlier in this narrative the author alluded to the possible weakness in in-patient referrals to the out-patient program. Further research into this area has allowed the author to more clearly identify the communication problems currently existing with this referral system.

**TABLE 20.0** FREQUENCY OF DIABETIC HOSPITAL ADMITTANCES
DECEMBER 1, 1973 -- MARCH 1, 1974*

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>December</th>
<th>January</th>
<th>February</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Diagnosis</td>
<td>10</td>
<td>6</td>
<td>8</td>
<td>24</td>
</tr>
<tr>
<td>Secondary Diagnosis</td>
<td>12</td>
<td>7</td>
<td>21</td>
<td>40</td>
</tr>
</tbody>
</table>

|                    |          |         |          |       |
|                    | 22       | 13      | 29       | 64    |

Table 20.0 is a brief comparison of the number of in-house diabetics who were admitted to Northridge over the past three months.*

It is interesting to note that the actual number of diabetics admitted who were diagnosed diabetic by a secondary diagnosis during this period was nearly 22 per month. Of a total 64 diabetics, only 9 patients were identified as receiving in-hospital diabetes instruction. This is an average of only 14% (Group Mean Pre Test 23.8; Post Test 25.5).

*Report taken from Diagnosis Index, supplied by the Northridge Hospital Foundation, Medical Records Department.
Apparently, the balance of the 86% of the diabetic patients admitted were either given informal instruction on the nursing floor and no one was aware of it, or proper communication with attending physicians is not taking place. If this is the case, this may be the greatest attributing factor to the low rate of referral and attendance of in-patients to the current out-patient program.

The author's discovery of the actual communications breakdown significantly affects the structure of the in-patient program. It has recently been suggested by the author that the teaching team organize and review the problem prior to complete implementation of the in-patient pilot study.

The in-patient pilot study was recently implemented and screening of diabetics for the in-patient control group, those to receive only conventional instruction, has recently begun. Based on the arbitrary limit of a maximum 60% pre test score to be included in the study (24 correct answers out of 40 questions), of six in-patients tested, three were included in the sample of 25 to be used as a control.

Planned data analysis for the pilot study will include evaluation of actual post test scores for both groups, and differences between pre and post test scores will be subjected to a chi-square analysis to ascertain significant differences in data. Analysis of data relating to collection of clinical information will also be based on statistical testing. A proposed approach to this data review is to record variances in blood sugar levels and other measurable phenomena and compute an average deviation from a baseline level which will be indicated by measured levels recorded on day of hospital discharge.
These variances will be tested for significance and possibly correlational procedures can be applied to determining significance of relationships between learning and management.

It is fully expected that the results of this study will produce data which will support the hypothesis in that the experimental group, those diabetics receiving both conventional teaching and programmed instruction, will be able to demonstrate a greater degree of learning exhibited by achieving higher test scores. Based on such data, it may even be possible to say something about a correlation between knowledge, and ability to manage disease with greater stability.
CHAPTER VII

INTERPRETATION OF RESULTS

The implementation of this study at both the in-patient and out-patient levels of the diabetic program was the first step toward definition of program effectiveness at Northridge. The results of data collected relating to the two main out-patient study populations indicated that a significant difference in patient knowledge level had been exhibited between those patients taking part in the instructional program and those diabetics who did not. Comparison of in-patient statistics to those of out-patients indicate that significant differences in patient learning took place among out-patients in relation to in-patients receiving conventional instruction, and of those diabetic in-patients in the hospital during the three month study period, only 14% were known to have received instruction. This would reflect the possible need for a better out-patient referral system if instruction is desired.

The author feels that many variables affect in-patient learning that were not tested thoroughly during this study period. One area of interest for the author is methods used for in-patient instruction. The in-patient pilot study utilizing adjunct instructional programming as a supplement to conventional instruction hopefully will give the teaching team greater insight into modifications needed for in-hos-
The rationale for selecting program instruction as a supplemental approach to diabetic instruction was subsequently due to its flexibility for short term instruction. The author observed that one of the major variables affecting the quality and quantity of patient education was the cost of providing the service. At Northridge, the prevailing feeling in regard to the responsibility of affording the patient appropriate health instruction lies primarily with the physician and secondarily with the patient care team. This secondary approach to patient education may include diet instruction from a registered dietician, or possibly a very time-consuming session(s) provided by a member of the nursing staff. Unfortunately, the cost of providing this service and the difficulty in coordinating such a program at the level of nursing service is viewed, at least at Northridge, as inconceivable. Considering the advantages of programmed instruction as referred to in the literature review, it is quite conceivable that by supplementing the "conventional instructional approach" currently utilized with programmed instruction, costs can be reduced while effectiveness can be increased.

If this proves to be true, low incidence of patient referrals to out-patient instructional sessions will be more likely to occur. But, it would be safer to assume that the diabetic was given a significant amount of information regarding health maintenance prior to hospital discharge. What needs to be done is a patient follow-up for both in-patient and out-patient components in an attempt to evaluate if knowledge actually affects disease stability in diabetics, and if signifi-
cant behavioral differences can be observed between the two study components. Hopefully, this will be done in the future by the teaching team or other interested researchers.

Data collected in reference to non-diabetic populations indicated that those persons who have prolonged contact with diabetics usually have a greater knowledge about diabetes, but it was also interesting to note that differences in pre test results showed non-diabetic scores ($\bar{x}=23.0$) to be slightly lower than diabetic pre test scores ($\bar{x}=25.2$). This is not a statistically significant difference, but it is identifiable. The author is not sure whether knowledge differences are actually significantly different between diabetic and non-diabetic groups and suggests that a more accurate instrument should be devised to more closely assess this area.

Data collected relating to nursing expertise in the area of diabetes allowed the author to assume that lack of knowledge was not a variable affecting low in-patient learning. But, it was concluded by the author that nursing knowledge of teaching methodology should be considered a possible area open to future research at Northridge. It is the author's feeling that subject area expertise is a prerequisite for instruction, but many knowledgeable instructors are poor teachers. The author questions the teaching ability of some nurse instructors and feels that future research into this area may find this variable a possible weakness in the in-hospital instructional program.

Evaluation of instructional content is an area that was not closely looked at. Brief analysis of content areas indicated that
diet information was lacking in most study populations, but the actual content was not assessed as to whether it was appropriate for the knowledge level of the study populations, and whether comprehension is necessary for disease stability. The author suggests that future study include evaluation of the instructional content, the premise for which such content is imparted to the patient, and the validity behind it.
CHAPTER VIII
SUMMARY AND CONCLUSIONS

Basically, the author's interaction with the various interest groups involved in the Northridge diabetic education program was quite favorable. The organizational goals originally outlined by the author as a framework for working with the instructional team were followed, and results of working with the team led to a closer definition of program effectiveness.

It is the honest opinion of the author that many areas usually considered as part of program planning were ignored by the planning body when developing the study approaches for both the in-patient and out-patient program. This was felt to be a structural weakness in the program, especially in the area of objective setting. But, the author does feel confident that much valuable information has been, and is still being collected to enable the teaching team to modify areas of program weakness. This group activity, even though minimal, was a significant happening in the group process. This has been the first attempt by this group, or any other group to evaluate the existing instructional program. What is even more important, what has been done by the group is the beginning of actual assessment of program viability.
Before the studies were implemented, both the author and the teaching team were curious about the actual effect this program had on members of the diabetic population. Currently, the group is at least able to say with a great deal of confidence that those persons who do take part in the educational program at the out-patient level do demonstrate an increase in knowledge related to the control and maintenance of diabetes. Further study paralleling that of Stone relating to the level of knowledge as a direct correlation to stability in control of diabetes can also be done now that the teaching group has begun to evaluate the teaching program.

Much work is still needed in the areas of program development. It is hoped that the recent activities taken on by the various members of the teaching group will lead to an expanded level of interest for evaluation of the various components of the program. Very limited attention was paid to the actual area of instructional content, and the evaluation of teaching methods was touched on very lightly. With greater team initiative toward evaluation of the total program exhibited, it is hoped that these areas of program evaluation will be more closely scrutinized in the future.

If there was one specific area of concentration that the author would liked to have seen more effectively exhibited, team organization would be it. The author feels strongly that the greatest weakness in the program is the team’s consistent inability to work together as a total group. Much can be accomplished if the interest is present and this is, in the author’s opinion, the key to successful program planning. The diabetic teaching team did not work together as a group.
Specific individuals had to work independently and direct planning was very sparse.

It is felt by the author that many variables intervene with individual and group motivation for working with the education program. Many of these variables are imposed from outside sources such as attitudes of specific hospital departments, administration and the current definition of program need by many key individuals. All the author can suggest is that by exhibiting skills in program planning, and by actually justifying the advantages gained by the target population from having an education program, no one can claim that the very presence of such education programs is a waste of time and resources, especially to the physician and his patient.

In conclusion, it was felt that a foundation was set for the teaching team to evaluate current program effectiveness and hopefully modify areas of weakness. One such area that is beginning to be studied is that of coordinating team members, nursing and the physician in a system of referral and in-patient instruction. Hopefully, the in-patient pilot study soon to be implemented in its totality will lay the framework for program modification.

The author's concern throughout this study was to identify a need for patient education. The author's rationalization in this concern was that there may exist an undefined need for patient education in diabetes and other disease areas, and that even though a system of educational referral may exist, a significant amount of pertinent information should be made available to the patient regarding health maintenance to assure that patient control can be maintained between
the time of discharge and attendance at ambulatory educational sessions. Looking back to the diabetic referral statistic that quoted 14% out-patient session attendance from all referred in-house diabetics allows us to assume that many diabetics may have left the hospital without proper education. As viewed by the author, it is the responsibility of the hospital to provide a necessary educational service to the community, unless the physician deems it unnecessary.
BIBLIOGRAPHY


APPENDIX A

NAME: ____________________________

WHAT DO YOU KNOW ABOUT DIABETES?

1. When a diabetic feels any of the symptoms of low blood sugar reaction, the first thing he should do is:
   a. Take fruit juice or a concentrated sweet immediately.
   b. Ask a relative to call for an ambulance.
   c. Drink some black coffee.
   d. I don't know.

2. The insulin which the body produces is chiefly responsible for:
   a. Slowing up the appetite for sugar.
   b. Helping the body use its glucose.
   c. Making the digestive juices effective.
   d. I don't know.

3. One unit of U-100 insulin has the same action in the body as:
   a. 10 units of U-40
   b. 1 unit of U-40
   c. 5 units of U-80
   d. I don't know

4. Cottage cheese is a:
   a. Heat exchange
   b. Fat exchange
   c. Milk exchange
   d. I don't know

5. If you start feeling very thirsty, drowsy, and develop a headache, nausea, vomiting, and frequent urination, you would first:
   a. Test your urine for sugar and acetone and call the doctor.
   b. Stop taking insulin or the diabetic pills until the vomiting stops.
   c. Eat some candy or sweetened drink.
   d. I don't know.

6. Some oral diabetic tablets:
   a. Are oral insulin.
   b. Stimulate the pancreas to secrete more insulin.
   c. Cure diabetes.
   d. I don't know.

7. When your urine test is usually negative, you would:
   a. Still test after every meal and at bedtime to make sure.
   b. Keep testing as often as ordered by your physician.
   c. Test only when you suspect some sugar in the urine.
   d. I don't know
8. All food that you eat is at least partially broken down in your body to glucose.
   a. True  
   b. False  
   c. I don't know

9. Some typical symptoms of insulin reaction are:
   a. Nausea, lack of appetite, diarrhea, fever.
   b. Nausea, headache, fever, drowsiness.
   c. Trembling, irritability, sweating, hunger.
   d. I don't know.

10. Polyuria (frequent urination) is a symptom of diabetes. This is the result of the body's attempt:
    a. To get the sugar to the body areas that need it.
    b. To replace fluids lost through the kidneys.
    c. To get rid of the excess sugar in the blood.
    d. I don't know.

11. When the diabetic has too much insulin, the complication that results is:
    a. Diabetic coma
    b. Hyperglycemia
    c. Hypoglycemia
    d. I don't know

12. Proper amounts of insulin can:
    a. Allow you to eat anything you like.
    b. Cure diabetes.
    c. Control diabetes.
    d. I don't know.

13. The person most responsible for good control of your diabetes is:
    a. Your doctor
    b. Yourself
    c. Your family

14. Illness or infection can cause the blood sugar to:
    a. Increase
    b. Decrease
    c. Go into the hypoglycemia range
    d. I don't know

15. For an insulin dependent diabetic, excessive exercise without diet and insulin changes may cause:
    a. Insulin reaction
    b. Acidosis
    c. Diabetic coma
    d. I don't know
16. A diabetic must give special care to his feet because:
   a. A diabetic must walk a great deal.
   b. Tight garters and shoes increase blood circulation to the feet.
   c. Diabetes may slow blood circulation in legs and feet.
   d. I don't know.

17. If you become involved in unexpected exercise such as a tennis match, you should:
   a. Increase your food intake and eat something extra before you play.
   b. Take an extra dose of insulin before you play.
   c. Not do anything out of your ordinary routine.
   d. I don't know.

18. When testing urine for sugar before breakfast, use:
   a. The first urine that you pass upon rising.
   b. The second urine that you pass upon rising.
   c. The urine passed on the previous evening.
   d. I don't know.

19. Cuts and other wounds will heal slowly in the uncontrolled diabetic because:
   a. The excess sugar in the blood decreases the healing properties.
   b. The excess of insulin interferes with the healing process.
   c. The blood is slow to clot.
   d. I don't know.

20. Blood relatives of most diabetics:
   a. Inherit diabetes.
   b. Inherit a tendency to get diabetes.
   c. Always get diabetes.
   d. I don't know.

21. The action of NPH or Lente insulin lasts:
   a. 4-6 hours
   b. 20-30 hours
   c. 28-36 hours
   d. I don't know

22. The obese person may develop diabetes because:
   a. He has eaten too much sugar.
   b. The pancreas gets exhausted trying to supply sufficient insulin for the excessive food intake.
   c. The kidneys have collected excessive fat and can't metabolize glucose.
   d. I don't know.
23. In caring for his feet, a diabetic should:
   a. Use sharp scissors and razor blade to cut toenails, corns, and callouses regularly.
   b. Bathe his feet daily in hot water with a strong soap.
   c. Inspect his feet every day and report any irritation or injury to his doctor.
   d. I don't know.

24. The insulin injection should be given:
   a. In the same spot as the last injection.
   b. Right next to the last injection.
   c. At least one inch away from the last injection.
   d. I don't know.

25. Some foods do not have to be measured because:
   a. They contain no carbohydrate, but many calories.
   b. They contain very few calories.
   c. They are all fat and have no effect on diabetes.
   d. I don't know.

26. One bread exchange provides approximately:
   a. 50 calories
   b. 70 calories
   c. 100 calories
   d. I don't know

27. Which of the following groups of food is considered free?
   a. Group A vegetables
   b. Fresh fruits
   c. Dietetic candies
   d. I don't know

28. The reading of one plus (1+) in any urine sugar test usually means that the urine contains:
   a. Excessive amount of sugar.
   b. Some sugar.
   c. No sugar.
   d. I don't know.

29. Regular or crystalline insulin will be circulating in the bloodstream and ready to begin action in about:
   a. 15-20 minutes
   b. 2-3 hours
   c. 30-60 minutes
   d. I don't know

30. All foods labelled "Dietetic" are all right for diabetics to use:
   a. True
   b. False
   c. I don't know
31. Which of the following is not included in the bread exchanges?
   a. Popcorn
   b. Sherbet
   c. Peanut butter
   d. Popsicles
   e. I don't know

32. Carbohydrates are:
   a. Fats and oils
   b. Sugars and starches
   c. Vitamins and minerals
   d. I don't know

33. An adequate supply of insulin is necessary for:
   b. The cells to use the blood sugar.
   c. Good bone and tooth development.
   d. I don't know.

34. Which food group acts primarily to build and repair your body tissues?
   a. Protein
   b. Carbohydrate
   c. Fats
   d. I don't know

35. Which of the following groups of food may be used whenever a diabetic wishes:
   a. Fresh fruit
   b. Canned soup, tomato sauce, ketchup
   c. Coffee, tea, bouillon
   d. I don't know

36. A diabetic diet is:
   a. A well-balanced diet the whole family can use.
   b. A planned system of special foods that are not included in regular diets.
   c. I don't know.

37. A diabetic may go into diabetic acidosis (also called diabetic coma) when he:
   a. Takes too much insulin, or has an infection or other illness or stress.
   b. Does not take enough insulin, or has an infection or other illness or stress.
   c. Eats too little and has an infection or other illness or stress.
   d. I don't know.
38. If your meal plan calls for 1 milk exchange you may:
   a. Use a glass of fruit juice instead.
   b. Eat cheese in place of it.
   c. Drink part of it and use the remainder in cooking.
   d. I don't know.

39. Canned fruit labelled "Dietetic" is fruit prepared:
   a. With extra sugar.
   b. Without sugar, but perhaps with an artificial sweetener.
   c. In the same way as other canned fruit.
   d. I don't know.

40. A diabetic may get low blood sugar reaction (also called insulin reaction):
   a. When he eats too much food.
   b. When he does not eat enough food, or eat at the proper time.
   c. When he does not take his insulin on time.
   d. I don't know.
APPENDIX B

DIABETES INFORMATION SHEET

I. Name_____________________________________

Name of your physician__________________________

II. Formal Education

Please check the numbered box below that corresponds to your last year of school completed. Check the box labeled NA if you have never attended school.

Elementary School  1  2  3  4  5  6
Junior High School  7  8  9
Senior High School  10  11  12
College, University, or Technical School  13  14  15  16
Post Graduates:  Second Bachelors  17
                      Master's  18
                      Doctorate  19

NA  20

III.

1. Sex:  Male □  Female □

2. Age Last Birthday: □  □

3. Height: □  feet □  inches

4. Weight: □  □  □  pounds
IV. (To be completed by a member of the teaching team or a nurse supervisor).

1. Nursing Floor:
   - Second
   - Pavilion South
   - Third
   - Pediatrics
   - Fourth

2. Length of Stay:
   - 1-2 days
   - 8-10 days
   - 3-4 days
   - More than 10 days
   - 5-7 days

3. Was admission primarily due to a condition relating to diabetes?
   - Yes
   - No

4. A diagnosis of diabetes was made:
   - Within 1 month of this hospitalization.
   - Within 6 months of this hospitalization.
   - Within 1 to 5 years of this hospitalization.
   - Greater than 5 years of this hospitalization.

5. Control is maintained by:
   - Diet alone
   - Diet and oral agent
   - Diet and insulin
   - No special manner

6. Does the patient have any relatives who have been diagnosed diabetic?
   - Yes
   - No
Dear

All of the staff involved with the Northridge Hospital Diabetes Education Program wish you well. It is our concern that those persons who look to us for information regarding the control of their diabetes be given pertinent information that can be utilized for the rest of their lives.

Enclosed is a copy of our program evaluation form. This evaluation is in the form of a test similar to those you took on the first and last nights of the session you attended. The purpose of this evaluation is to help us discover areas of strength and weakness in our program. It would be difficult for us to offer a program that meets the personal needs of each individual unless we have feedback about the program. This evaluation is designed to help us identify areas that may need to be altered, left out, or more closely discussed during the course of the program.

At your convenience, please complete the enclosed evaluation and return it to us by mail. A self-addressed stamped envelope has been enclosed for your convenience.

We want to thank you for your participation and concern for making our Diabetes Program a truly worthwhile experience.

We will be looking forward to hearing from you soon.

Sincerely,

Jan Williams
Program Coordinator

JW/bj
APPENDIX D

INTRODUCTION

Patient education is an important aspect of health care, especially for those patients who must master knowledge and techniques of self-management essential to living with long term and chronic illnesses. Patient education has also been recognized as a nursing responsibility and function, and it is therefore essential for nursing to utilize instructional methods which best facilitate patient learning.

The attached evaluation is designed to assess the level of expertise an individual may exhibit when working with diabetic patients. This evaluation is formulated around specific educational objectives used in teaching patients about diabetes. This evaluation is not designed to assess clinical knowledge but to evaluate comprehension of specific information common to the control and maintenance of diabetes.

In an attempt to evaluate the many variables that may affect patient learning, it is essential to be able to make some valid statement about the level of expertise available to the patient. This study is designed to derive data upon which such a statement may be justified.

OBJECTIVE

To assess the current level of expertise among nursing personnel at Northridge Hospital relating to the control and maintenance of diabetes mellitus.

METHODS

1. Each and every member of the nursing team will be given a copy of a forty item evaluation on diabetes to complete.

2. The evaluation will be distributed by the Director of Nursing and upon completion should be returned to the nursing office by March 20.

3. Instructions for completion of the evaluation will be attached to the evaluation itself. It is not necessary to identify individual evaluations by name. The purpose of this study is not to assess specific levels of knowledge, but is to gain insight into total staff expertise.

4. The only identification that must appear on the evaluation is the job classification or position held by the person who completed the evaluation.

5. The evaluation is to be completed without the aid of resource materials, friends, or colleagues. The use of such help would invalidate any results and would therefore make interpretation virtually impossible.

EVALUATION

The completed evaluations will be studied and compared to group results obtained from previous testing. The data will be analyzed by staff position, (N.A., R.N., Head Nurse, etc.), and will be classified as "control group results."

APPLICATION

The application of this data may be felt in the future or possibly not at all. With empirical data, logical assumptions about program effectiveness can be made. Without such data, no objective conclusions can be made. It is hoped that the data collected will be used for a practical purpose.
INTRODUCTION

The attached evaluation is designed to assess the level of expertise an individual may exhibit when working with diabetic patients. This evaluation is formulated around specific educational objectives used in teaching patients about diabetes. This evaluation is not designed to assess clinical knowledge but to evaluate comprehension of specific information common to the control and maintenance of diabetes.

INSTRUCTIONS

1. There is a total of 40 items on this evaluation. For each item circle the letter preceding the statement that you feel best represents the correct answer in each item. If you don't know the correct answer, or you are not sure of the correct answer, circle the letter directly to the left of the selection, I Don’t Know. Please complete all forty items.

2. Return the completed evaluation to the nursing office by March 20.

3. Be sure that you have labeled your evaluation according to your job title or position, (N.A., L.V.N., R.N., Head Nurse, or Nurse Supervisor). It is not necessary to identify yourself by name.

4. Please identify whether you work in a medical-surgical unit, or in a specialty unit such as ICU, CCU, Pediatrics, or Rehabilitation in the space below. It is not necessary to identify your specific unit or floor.

   Please check the appropriate statement below. Check only one.
   
   _____ I work in a Medical-Surgical Unit.
   
   _____ I work in a Specialty Unit such as ICU, CCU, Pediatrics, or Rehabilitation.
APPENDIX E

To be completed one month after discharge from hospital.

Name__________________________________________ Age__________ Sex__________

Marital Status__________________ No. of appts, scheduled since discharge__________

No. of appts, kept since discharge__________

Blood Sugar on day of discharge from hospital care______________________________

Blood Sugar levels since discharge (include date and mgm %)_____________________

Prescribed program of urine testing: Method___________________________________

Times per day________________

No. of times patient tests urine (from self kept record) Include date of appt and number of urine tests performed between appts. Note any changes in no. of times patient is instructed to complete urine testing)_____________________

No. of self-reported occurrences of insulin reactions since discharge__________

No. and type of self or doctor reported infections since discharge__________

Please note any type of additional instruction patient has received on diabetic care since discharge from hospital. (note type and by whom instructed)_____________________

_____________________________________________________________________________